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A SEED COUNTER

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The taking of the sample is the first important step in analyzing any substance. In many seed-testing laboratories it is customary to take the sample of seed used in making the purity analysis by means of a mechanical sampler. After this sample has been separated into its component parts—pure seed, other-crop seeds, weed seeds, and inert matter—a subsequent smaller sample is tested for germination. It is the usual practice to count from the pure seed 200, 400, 600, or 800 seeds for this purpose. In using a relatively small number of seeds for the germination test, it is essential that those seeds represent as accurately as possible the average quality of the seed being tested. In counting out by hand the seeds to be used in making the germination test, it is difficult to make the count indiscriminately from the sample. The use of a mechanical counter tends to eliminate the personal element in selecting the seeds used for the germination test. The seeds can be counted more quickly with the mechanical counter than by hand, and there is the added advantage that the counter places the seeds on the seed bed evenly spaced.

The seed counter described herein was developed in the seed laboratory of the Bureau of Plant Industry and has been found to be an aid to accuracy and speed in testing seeds for germination. This counter is not patented, and there is no restriction on its manufacture or use.

The detailed drawings in Figures 1 and 2, show the construction of the counter, which is made entirely of brass. It consists essentially of a metal plate through which are drilled 100 holes. This plate forms the top of a vacuum box which is connected with a vacuum pump through a hand-operated valve and a heavy-walled flexible tube. In no place should the inside diameter of the vacuum line, either in the flexible tube or in the valve, be less than three-eighths of an inch. Success in using the counter for a wide variety of seeds depends on having separate counters with holes of a size suitable for the seed being counted. Three counters with holes 0.008, 0.013, and 0.02 of an inch in diameter will accommodate seeds ranging in size from those of timothy to those of wheat.

To use the seed counter, hold it with the perforated plate up, open the hand valve controlling the vacuum to suit the seed being counted, pour an excess of seeds on the plate, and shake gently until

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a seed is held over each hole, and then pour off the surplus seeds. Occasionally there will be a hole with no seed covering it, or two seeds may be held over one hole. These irregularities should be adjusted with hand tweezers. The seeds are held in place by the vacuum, while the seed counter is turned with the perforated plate down and placed on the seed bed. The valve is then closed, releasing the vacuum, which allows the seeds to fall evenly spaced on the seed bed.

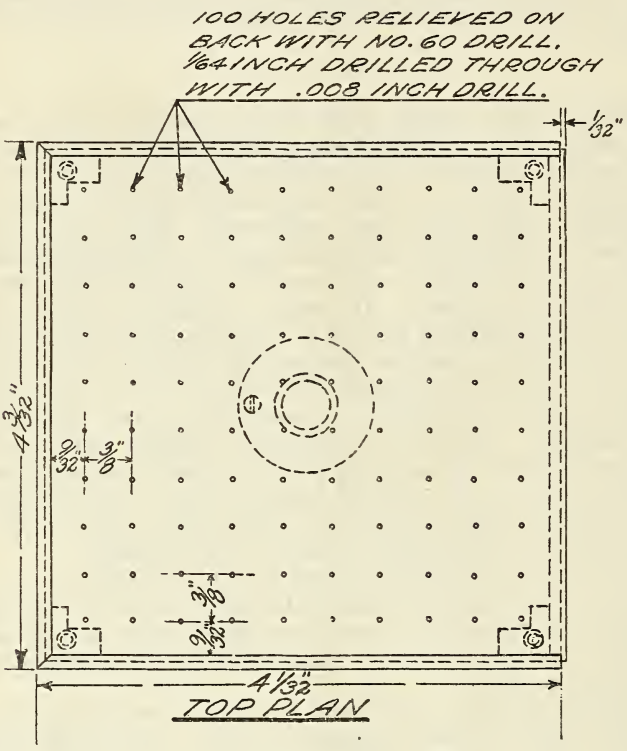

FIG. 1.—Top plan of seed counter

The counter illustrated can be used not only to place the seeds on a blotter substratum but also to plant them in the small soil boxes used in this and other laboratories. A modification of this counter, in which the 100 holes are arranged in three rows 10 inches long and 1 inch apart, has proved satisfactory for planting seeds in soil flats for greenhouse tests.

This type of seed counter is adapted for use with cereals (other than oats), clovers, alfalfa, vetch, rape, sorghum, timothy, and all seeds having a somewhat regular outline, but it is not satisfactory for counting seeds of oats, orchard grass, and other grasses having loose and irregular glumes and such small seeds as Agrostis.

To operate the counter satisfactorily, a pump furnishing a vacuum of at least 27 inches of mercury is desirable. The capacity of the pump is also important. A pump with a capacity of 6 cubic feet of

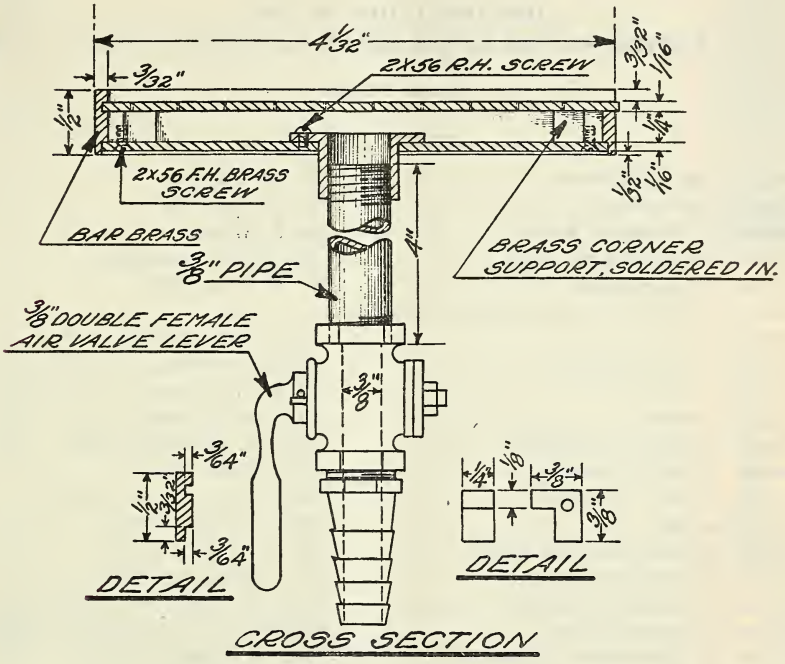

FIG. 2.—Cross section of seed counter

free air per minute is satisfactory for the smaller and more regular seeds, such as the clovers and Brassicas and even hairy vetch. Larger seeds, such as wheat, and irregular seeds that do not cover the holes well would require a pump of larger capacity.

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